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January 2007

## Test 1913: Case-IH Magnum 305 and MX 305 Diesel 19-Speed

Tractor Museum

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# NEBRASKA OECD TRACTOR TEST 1913—SUMMARY 585

## CASE IH MAGNUM 305 DIESEL

## ALSO CASE IH MX 305 DIESEL

## 19 SPEED

### POWER TAKE-OFF PERFORMANCE

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1109 rpm)					
256.66 (191.39)	2000	15.57 (58.92)	0.425 (0.259)	16.49 (3.25)	
Maximum Power (1 hour)					
299.70 (223.49)	1800	17.02 (64.44)	0.398 (0.242)	17.61 (3.47)	
Standard Power Take-off Speed (998 rpm)					
299.70 (223.49)	1800	17.02 (64.44)	0.398 (0.242)	17.61 (3.47)	

### VARYING POWER AND FUEL CONSUMPTION

256.66 (191.39)	2000	15.57 (58.92)	0.425 (0.259)	16.49 (3.25)	Air temperature
226.27 (168.73)	2077	14.88 (56.34)	0.461 (0.280)	15.20 (2.99)	80°F (26°C)
174.90 (130.42)	2134	13.26 (50.18)	0.531 (0.323)	13.19 (2.60)	Relative humidity
119.48 (89.09)	2186	9.87 (37.38)	0.579 (0.352)	12.10 (2.38)	18%
60.55 (45.16)	2248	6.54 (24.74)	0.756 (0.460)	9.27 (1.83)	Barometer
2.20 (1.64)	2250	3.68 (13.94)	11.748 (7.146)	0.60 (0.12)	29.17" Hg (98.78 kPa)

Maximum torque - 1019 lb.-ft. (1382 Nm) at 1400 rpm

Maximum torque rise - 51.2%

Torque rise at 1601 engine rpm - 38%

Power increase at 1800 engine rpm - 16.8%

### DRAWBAR PERFORMANCE

### UNBALLASTED - FRONT DRIVE ENGAGED

### FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
Maximum Power—9th Gear									
220.34 (164.31)	14367 (63.91)	5.75 (9.26)	2000	4.1	0.495 (0.301)	14.16 (2.79)	189 (87)	46 (8)	28.94 (98.00)
75% of Pull at Maximum Power—9th Gear									
176.90 (131.91)	10831 (48.18)	6.12 (9.86)	2105	3.1	0.574 (0.349)	12.21 (2.41)	189 (87)	48 (9)	28.94 (98.00)
50% of Pull at Maximum Power—9th Gear									
122.59 (91.42)	7214 (32.09)	6.37 (10.26)	2169	2.1	0.686 (0.417)	10.21 (2.01)	188 (87)	55 (13)	28.94 (98.00)
75% of Pull at Reduced Engine Speed—11th Gear									
176.53 (131.63)	10786 (47.98)	6.14 (9.88)	1602	2.9	0.485 (0.295)	14.46 (2.85)	185 (85)	50 (10)	28.94 (98.00)
50% of Pull at Reduced Engine Speed—11th Gear									
122.47 (91.33)	7199 (32.02)	6.38 (10.27)	1650	1.9	0.556 (0.338)	12.61 (2.49)	185 (85)	56 (13)	28.94 (98.00)

**Location of tests:** Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

**Dates of tests:** October 24 - November 14, 2007

**Manufacturer:** CNH America LLC, 700 State St. Racine, Wi. 53404 USA

**FUEL, OIL and TIME:** Fuel No. 2 Diesel Specific gravity converted to 60°/60°F (15°/15°C) 0.8417 Fuel weight 7.008 lbs/gal (0.840 kg/l) Oil SAE 15W40 API service classification CI-4 Transmission and hydraulic lubricant Case IH Hy-Tran Ultra fluid Front axle lubricant SAE 85W-140 API GL-5 Total time engine was operated: 25.0 hours

**ENGINE: Make** CNH Engine Corporation Diesel **Type** six cylinder vertical with turbocharger and air to air intercooler **Serial No.** \*46751031\* **Crankshaft** lengthwise **Rated engine speed** 2000 **Bore and stroke** 4.488" x 5.689" (114.0 mm x 144.5 mm) **Compression ratio** 17.6 to 1 **Displacement** 540 cu in (8849 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements **Fuel cooler** radiator for pump return fuel **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

**ENGINE OPERATING PARAMETERS: Fuel rate:** 107.8-118.8 lb/h (48.9 - 53.9 kg/h) **High idle:** 2220-2260 rpm **Turbo boost:** nominal 21.0 - 25.4 psi (145 - 175 kPa) as measured 23.5 psi (162 kPa)

**CHASSIS: Type** front wheel assist **Serial No.** \*Z7RZ04015\* **Tread width** rear 64.0" (1626 mm) to 129.0" (3277 mm) front 60.0" (1524 mm) to 88.0" (2235 mm) **Wheelbase** 118.3" (3005 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Nominal travel speeds mph (km/h)** first 1.97 (3.17) second 2.26 (3.64) third 2.60 (4.19) fourth 2.99 (4.81) fifth 3.43 (5.52) sixth 3.93 (6.33) seventh 4.59 (7.38) eighth 5.26 (8.47) ninth 6.06 (9.77) tenth 6.96 (11.20) eleventh 7.98 (12.85) twelfth 9.16 (14.74) thirteenth 11.41 (18.37) fourteenth 13.09 (21.07) fifteenth 15.10 (24.30) sixteenth 17.32 (27.87) seventeenth 19.87 (31.97) eighteenth 22.79 (36.67) nineteenth 24.86 (40.00) (1750 engine rpm) reverse 2.83 (4.56), 3.26 (5.24), 6.61 (10.63), 7.57 (12.19) **Clutch** multiple wet disc electrohydraulically operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 1806 engine rpm or 1000 rpm at 1803 engine rpm **Unladen tractor mass** 21585 lb (9791 kg)

# **DRAWBAR PERFORMANCE** **UNBALLASTED - FRONT DRIVE ENGAGED** **MAXIMUM POWER IN SELECTED GEARS**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Temp. °F cool- ing med	Temp. °C Air dry bulb	Barom. inch Hg (kPa)	
6th Gear									
195.62 (145.88)	20366 (90.59)	3.60 (5.80)	2036	9.4	0.541 (0.329)	12.97 (2.55)	189 (87)	49 (9)	29.17 (98.78)
7th Gear									
218.86 (163.20)	20018 (89.04)	4.10 (6.60)	1974	8.5	0.500 (0.304)	14.00 (2.76)	190 (88)	53 (12)	29.15 (98.71)
8th Gear									
238.94 (178.18)	19789 (88.03)	4.53 (7.29)	1894	8.0	0.481 (0.293)	14.56 (2.87)	190 (88)	55 (13)	29.14 (98.68)
9th Gear									
252.71 (188.45)	18929 (84.20)	5.01 (8.06)	1798	7.2	0.468 (0.284)	14.99 (2.95)	190 (88)	57 (14)	29.14 (98.68)
10th Gear									
255.47 (190.50)	16309 (72.54)	5.87 (9.45)	1800	5.1	0.461 (0.281)	15.19 (2.99)	189 (87)	57 (14)	28.95 (98.04)
11th Gear									
254.36 (189.68)	14013 (62.33)	6.81 (10.96)	1800	4.1	0.463 (0.282)	15.12 (2.98)	189 (87)	57 (14)	28.95 (98.04)
12th Gear									
253.57 (189.08)	12056 (53.63)	7.89 (12.69)	1804	3.3	0.465 (0.283)	15.08 (2.97)	189 (87)	57 (14)	28.95 (98.04)
13th Gear									
250.85 (187.06)	9498 (42.25)	9.90 (15.94)	1804	2.7	0.471 (0.287)	14.87 (2.93)	189 (87)	59 (15)	28.95 (98.04)

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments.

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests the fuel temperature at the primary fuel filter was maintained at 113°F (45°C). The manufacturer's claims of 59 GPM(223 lpm) and 75 GPM(282 lpm) remote hydraulic flow were not verified. The pull in 6th<sup>th</sup> gear (unballasted tractor) was limited to avoid excessive tractor bouncing. The performance results on this summary were taken from OECD tests conducted under the Code II Test Code Procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1913**, Nebraska Summary 585, December 17, 2007.

Roger M. Hoy  
Director

M.F. Kocher  
V.I. Adamchuk  
J.A. Smith  
Board of Tractor Test Engineers

## **TRACTOR SOUND LEVEL WITH CAB**

**dB(A)**

At no load in 7th gear	69.2
Bystander in 18th gear	88.4

## **TIRES, BALLAST AND WEIGHT**

	With Ballast	Without Ballast
<b>Rear Tires</b> -No., size, ply & psi (kPa)	Four 520/85R42;**,13(90)	Two 520/85R42;**,16(110)
<b>Ballast</b> - Duals (total)	1950 lb (885 kg)	None
- Cast Iron (total)	6025 lb (2733 kg)	None
<b>Front Tires</b> -No., size, ply & psi (kPa)	Four 420/90R30;**,13(90)	Two 420/90R30;**,16(110)
<b>Ballast</b> - Duals (total)	1030 lb (467 kg)	None
- Cast Iron (total)	2650 lb (1202 kg)	None
<b>Height of Drawbar</b>	17.5 in (445 mm)	17.0 in(430 mm)
<b>Static Weight with operator</b> - Rear	19875 lb (9015 kg)	13110 lb(5946 kg)
- Front	13540 lb (6142 kg)	8650 lb(3924 kg)
- Total	33415 lb(15157 kg)	21760 lb(9870 kg)

**DRAWBAR PERFORMANCE**  
**BALLASTED - 1800 ENGINE RPM**  
**MAXIMUM POWER IN SELECTED GEARS**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
3rd Gear									
207.69 (154.88)	34027 (151.36)	2.29 (3.68)	1997	11.6	0.525 (0.319)	13.35 (2.63)	190 (88)	52 (11)	29.07 (98.44)
4th Gear									
226.57 (168.95)	32368 (143.98)	2.62 (4.22)	1929	8.6	0.493 (0.300)	14.21 (2.80)	190 (88)	53 (12)	29.07 (98.44)
5th Gear									
245.01 (182.70)	31984 (142.27)	2.87 (4.62)	1831	8.1	0.479 (0.291)	14.64 (2.88)	190 (88)	54 (12)	29.07 (98.44)
6th Gear									
251.86 (187.81)	28537 (126.94)	3.31 (5.33)	1804	5.6	0.468 (0.285)	14.96 (2.95)	190 (88)	55 (13)	29.07 (98.44)
7th Gear									
257.31 (191.88)	24721 (109.96)	3.90 (6.28)	1802	4.4	0.461 (0.280)	15.22 (3.00)	190 (88)	55 (13)	29.08 (98.48)
8th Gear									
258.35 (192.65)	21504 (95.65)	4.51 (7.25)	1798	3.5	0.455 (0.277)	15.41 (3.04)	190 (88)	56 (13)	29.08 (98.48)
9th Gear									
256.15 (191.01)	18353 (81.64)	5.23 (8.42)	1801	2.8	0.459 (0.279)	15.28 (3.01)	190 (88)	56 (13)	29.08 (98.48)
10th Gear									
254.55 (189.82)	15843 (70.47)	6.03 (9.70)	1800	2.4	0.462 (0.281)	15.15 (2.99)	190 (88)	56 (13)	29.08 (98.48)
11th Gear									
250.53 (186.82)	13545 (60.25)	6.94 (11.16)	1800	2.1	0.471 (0.286)	14.89 (2.93)	190 (88)	57 (14)	29.09 (98.51)
12th Gear									
246.74 (183.99)	11638 (51.77)	7.95 (12.80)	1796	1.7	0.478 (0.291)	14.66 (2.89)	190 (88)	58 (14)	29.09 (98.51)
13th Gear									
242.37 (180.73)	9114 (40.54)	9.97 (16.05)	1800	1.5	0.487 (0.296)	14.40 (2.84)	190 (88)	59 (15)	29.10 (98.54)

### THREE POINT HITCH PERFORMANCE(OECD Static Test)

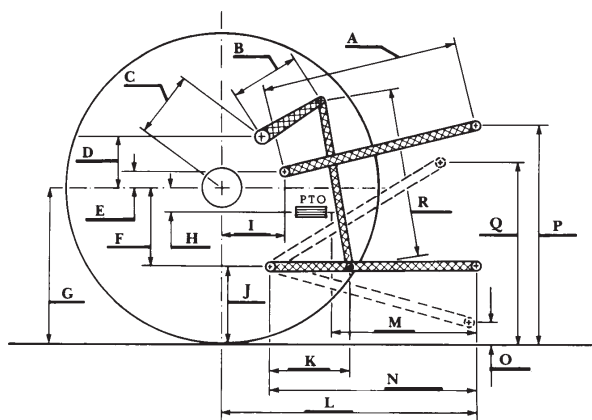
CATEGORY: III

Quick Attach: Yes

Maximum force exerted through whole range: 16375 lb (72.8 kN) High Lift Option  
17931 lb (79.8 kN)

	38.6 GPM pump	44.0 GPM pump
i) Sustained pressure at compensator cutoff:	3128 psi (216 bar)	3141 psi (216 bar)
ii) Pump delivery rate at minimum pressure and rated engine speed:	39.2 GPM (148.4 l/min)	44.2 GPM (167.2 l/min)
iii) Pump delivery rate at maximum hydraulic power:	38.3 GPM (145.0 l/min)	44.2 GPM (167.4 l/min)
Delivery pressure:	2853 psi (197 bar)	2903 psi (200 bar)
Power:	63.8 HP (47.5 kW)	74.9 Hp (55.8 kW)

### HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	mm
A	28.2	718
B	20.5	520
C	22.9	581
D	20.7	525
E	10.5	266
F	15.7	400
G	36.4	925
H	3.5	90
I	20.9	530
J	20.7	525
K	30.2	768
L	46.1	1170
*L'	50.7	1287
M	20.1	511
N	38.2	970
O	9.0	230
P	47.6	1210
Q	40.7	1035
R	39.2	995

\*L' to Quick Attach ends



CASE IH MAGNUM 305 DIESEL